

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants amended claim 1 to recite that the first, low-gloss region is a region in which, prior to curing the ionizing radiation-curable resin composition of the surface protective layer, resin components of low-luster pattern ink contained in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin composition are mixed but not completely compatibilized with each other and are kept in a suspended state, which mixture is fixed upon crosslinking and curing the surface protective layer, whereby in the first, low-gloss region the low-luster pattern ink and the resin composition of the surface protective layer have interacted with each other to provide partial elution, dispersion and mixing therebetween, so as to be in a suspended state which is fixed in the first, low-gloss region.

Claim 2 has been amended to recite that a low-gloss region is provided in a first portion of the surface protective layer just above the low-gloss pattern ink layer and in the vicinity of the first portion, the low-gloss region being a region in which, prior to curing the ionizing radiation-curable resin composition of the surface protective layer, resin components of the low-gloss pattern ink contained in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin composition are mixed but not completely compatibilized with each other and are kept in a suspended state, which mixture is fixed upon crosslinking and curing the surface protective layer, whereby in the low-gloss region the low-luster pattern ink and the resin composition of the surface protective layer have interacted with each other to provide partial elution, dispersion and mixing

therebetween, so as to be in a suspended state which is fixed in the low-gloss region.

In connection with amendments to claims 1 and 2, note, for example, the paragraph bridging pages 19 and 20, and sole full paragraph on page 20, of Applicants' specification.

In light of amendments to claims 1 and 2, Applicants are cancelling claims 30-33 without prejudice or disclaimer.

In addition, Applicants are adding new claims 36-39 to the application. Claims 36 and 38, dependent respectively on claims 1 and 2, respectively recites that the mixture, fixed in the suspended state, scatters light so as to impart to the low-gloss region a low gloss (in particular, in claim 36, so as to impart to the first, low-gloss region a lower gloss than that of the second region). Claims 37 and 39, dependent respectively on claims 36 and 38, recite that the low-gloss region is recognized as a concave portion due to optical illusion. Note, in particular, the paragraph bridging pages 19 and 20 of Applicants' specification.

The concurrently filed RCE Transmittal is noted. In view of the filing of this RCE Transmittal, it is respectfully submitted that entry of the present amendments is a matter of right, notwithstanding the Finality of the Office Action mailed August 4, 2010. Furthermore, it is respectfully submitted that the present amendments, and the following Remarks, constitute the necessary Submission for this RCE Transmittal.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed August 4, 2010, that is, the teachings of the U.S. patents to Takahashi, No. 6,326,074, to

Morishima, et al., No. 6,306,947, to Takeuchi, et al., No. 6,558,799, to Tsukada, et al., No. 5,296,340, to Ogawa, et al., No. 5,266,397, to MacQueen, No. 6,841,221, and to Klun, et al., No. 4,855,184, under the provisions of 35 USC 103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a decorative material, or decorative plate, as in the present claims, including, inter alia, the low-luster pattern ink layer and surface protective layer, with the surface protective layer being provided with a first, low-gloss region, located in a portion just above the pattern ink layer and in the vicinity of this portion, the first, low-gloss region being visually recognized as a concave portion, pattern ink of the pattern ink layer containing a non-crosslinked urethane resin and an unsaturated polyester resin as a binder, the non-crosslinked urethane resin having a number average molecular weight in the range of 10,000-50,000 and a glass transition temperature in the range of -70° to -40°C, and wherein the low-gloss region is a region in which, prior to curing the ionizing radiation-curable resin composition of the surface protective layer, resin components of low-luster pattern ink contained in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin composition are mixed but not completely compatibilized with each other and are kept in a suspended state, which mixture is fixed upon crosslinking and curing the surface protective layer, whereby in the low-gloss region the low-luster pattern ink and the resin composition of the surface protective layer have interacted with each other to provide partial elution, dispersion and mixing therebetween, so as to be in a suspended state which is fixed in the low-gloss region. See claim 1. Note also claim 19.

In addition, it is respectfully submitted that these applied references would have neither taught nor would have suggested such a decorative material as in the present claims, having the pattern ink layer and surface protective layer, the pattern ink which forms the pattern ink layer containing a non-crosslinked urethane resin as a binder and the ionizing radiation-curable resin composition containing a (meth)acrylate monomer, the non-crosslinked urethane resin having a number average molecular weight in a range of 10,000-50,000 and a glass transition temperature in a range of -70° to -40°C, wherein a low-gloss region is provided in a first portion of the surface protective layer just above the low-gloss pattern ink layer and in the vicinity of this first portion, and wherein the low-gloss region is a region in which, prior to curing the ionizing radiation-curable resin composition of the surface protective layer, resin components of the low-luster pattern ink contained in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin are mixed but not completely compatibilized with each other and are kept in a suspended state, which mixture is fixed upon crosslinking and curing the surface protective layer, whereby in the low-gloss region the low-luster pattern ink and the resin composition of the surface protective layer have interacted with each other to provide partial elution, dispersion and mixing therebetween, so as to be in a suspended state which is fixed in the low-gloss region. See claim 2. Note also claim 28.

As will be discussed in more detail infra, it is respectfully submitted that the present invention differs from the teachings of the applied references, including Takahashi, by the structure and mechanism by which the concavo-convex appearance is achieved. That is, in Takahashi, the non-penetrable layer 5 is provided on the penetrable layer 4, and the convex portion is provided on the non-

penetrable layer 5, thus realizing the concavo-convex appearance. To be specific, it is necessary in Takahashi that the non-penetrable layer 5 be provided adjacent the top coat 6, to provide a physical convex structure above the non-penetrable layer 5. Takahashi physically provides the concavo-convex appearance due to the use of the non-penetrable layer 5 adjacent the top coat 6; and in view thereof, would have taught away from the penetration and mixing between the pattern ink of the pattern ink layer and material of the surface protective layer as in the present invention.

In contrast, according to the present invention the concavo-convex appearance is provided due to optical illusion (see especially claims 37 and 39), through the combination of the specified low-luster ink layer having the specified non-crosslinked urethane as in all of the present claims, interacting with the surface protective layer. It is emphasized that according to the present invention the concavo-convex appearance is due to optical illusion. Note, in particular, the paragraph bridging pages 19 and 20 of Applicants' specification.

Thus, Takahashi and the present invention are entirely different from each other, both in the structure claimed and in the mechanism by which this structure achieves the concavo-convex appearance.

It is respectfully submitted that this different mechanism of concavo-convex appearance of the present invention, achieved due to the different structure thereof (and, in particular, the surface protective layer and the pattern ink layer, directly in contact therewith, interacting), would not have been disclosed or suggested by the teachings of the applied references, as discussed infra.

Attention is respectfully directed to the last full paragraph on page 20 of Applicants' specification (correspondingly, paragraph [0071] on page 6 of the published application for the above-identified application). As indicated therein, and

in the following paragraph, through use of the urethane resin as in the present claims, that is, a non-crosslinked urethane resin, e.g., having a molecular weight and glass transition temperature as in the present claims, the composition forming the surface protective layer and the low-luster pattern ink can effectively interact to obtain a more remarkable difference in gloss of the pattern, so as to achieve the optical illusion by which the appearance of the decorative material of the present invention is achieved.

To emphasize, Takahashi physically obtains the concavo-convex appearance through non-interaction of the topcoat 6 and non-penetrable layer 5. It is respectfully submitted that such disclosure in Takahashi, either alone or in combination with teachings of other references as applied by the Examiner, would have neither disclosed nor would have suggested the combination of surface protective layer in direct contact with the low-luster pattern ink layer, with the pattern ink layer being formed of a low-luster pattern ink containing, inter alia, a non-crosslinked urethane resin, with the non-crosslinked urethane resin having a number average molecular weight and a glass transition temperature as in all of the present claims; and, moreover, the non-crosslinked urethane resin and the surface protective layer interact (resin components of the pattern ink contained in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin composition are mixed but not completely compatibilized with each other and are kept in a suspended state, the mixture being fixed upon crosslinking and curing the surface protective layer, whereby in the low-gloss region the low-luster pattern ink and the resin composition of the surface protective layer have interacted with each other to provide partial elution, dispersion and mixing therebetween, so as to be in a suspended state which is fixed in the low-gloss region). Such interacted

components which are fixed in the low-gloss region achieve the optical illusion of the appearance, as discussed in the foregoing.

It is noted that the structure of the present invention can include a penetration-preventing layer (note penetration-preventing layer 8 in Fig. 1 of Applicants' disclosure). According to aspects of the present invention, the surface protective layer at the parts where the concave appearance is not realized is in contact with this penetration-preventing layer 8. However, it is emphasized that according to the present invention, the optical illusion is achieved due to interaction between the surface protective layer 5 and pattern ink layer 3, and such structure and interaction between the surface protective layer 5 and pattern ink layer 3, as in the present claims, would have neither been disclosed nor would have been suggested by the teachings of the applied references.

It is respectfully submitted that the present invention differs from Takahashi even when the present invention includes a penetration-preventing layer 8, as in aspects of the present invention. That is, in the present invention the surface protective layer at the parts where the concave form is not realized is in contact with only the penetration-preventive layer 8, while the top coat layer at the parts where the convex form in Takahashi appears, is in contact with only the penetration layer, as shown in Fig. 1 of Takahashi.

Noting especially claims such as claims 15, 17, 26, 27, 34 and 35, according to various aspects of the present invention a penetration-preventing layer is formed between the substrate and the low-luster pattern ink layer, directly opposite to the structure of Takahashi, wherein the non-penetrable layer 5 is provided between the top coat 6 and penetrable layer 4.

Thus, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such decorative material as in the present claims, having features as discussed previously in connection with claims 1 and 2, and, additionally, wherein a penetration-preventing layer is formed between the substrate and the low-luster pattern ink layer (see claims 15 and 26); and/or wherein the penetration-preventing layer is provided between the substrate and the low-luster pattern ink layer, with the penetration-preventing layer having provided thereon the low-luster pattern ink layer and the surface protective layer (see claims 34 and 35); and/or wherein a colored layer, a pattern layer and a penetration-preventing layer are successively laminated on the substrate, providing laminated layers, with the low-luster pattern ink layer and surface protective layer which is present on and in direct contact with the low-luster pattern ink layer so as to cover a whole surface including both the region where the low-luster pattern ink layer is formed and the region where no low-luster pattern ink layer is formed, are successively formed on the laminated layers (see claims 17 and 27).

The contention by the Examiner in the first full paragraph on page 29 of the Office Action mailed August 4, 2010, is noted. It is respectfully submitted that the element 8 is in Fig. 1 of Applicants' disclosure, not in Fig. 1 of Takahashi. Applicants again respectfully submit that the penetration-preventive layer 8 of the present invention is not located adjacent the surface protective layer 5, at locations where the pattern ink layer 3 is located, different from the teachings of Takahashi wherein the penetration preventive layer 5 has been treated by the Examiner as the ink layer (corresponding to Applicants' pattern ink layer 3) contacting the surface protection layer.

The additional contention by the Examiner that the penetration-preventing layer, apparently of Takahashi, is layer 2, layer 5 being the low-luster ink pattern, is noted. It must be emphasized, however, that layer 5 in Takahashi is a penetration-preventive layer, clearly teaching away from the interaction of the surface protective layer 5 and pattern ink layer 3, forming the low-gloss region 4, as in the present invention.

The further contention by the Examiner, that layer 5 of Takahashi is the low-luster ink pattern, is noted. It must be emphasized, however, that this layer 5 of Takahashi is not penetrable by the surface protective layer. While such layer 5 may be an ink pattern, clearly it would have taught away from the interaction between the low-luster pattern ink and resin composition of the surface protective layer to thereby provide the low-gloss region, achieving objectives according to the present invention.

The additional contention by the Examiner in the first paragraph on page 30 of the Office Action mailed August 4, 2010, is noted. The Examiner's attention is respectfully directed to claims 36 and 38, dependent respectively on claims 1 and 2, and reciting that the mixture, fixed in the suspended state, "scatters light so as to impart the lower gloss.

According to aspects of the present invention, it is important that the low-luster pattern ink of the pattern ink layer 3 has a property of interacting with the ionizing radiation-curable resin composition that forms the surface protective layer 5. By providing such surface protective layer and the low-luster pattern ink layer as in the present claims, in direct contact with each other, the ink of the low-luster pattern ink layer and the surface protective layer are interacted with each other as expressly set forth in claims 1 and 2, to cause partial elution, dispersion and mixing therebetween. In such a case, respective resin components of the ink contained in

the low-luster pattern ink layer and the uncured ionizing radiation-curable resin are not completely compatibilized with each other for a short period of time, but are kept in a suspended state and located in a portion just above the low-luster pattern ink layer and in the vicinity of this portion, so that the suspended portion scatters light to form the low-gloss region. When the surface protective layer is crosslinked and cured while maintaining the suspended state, the suspended state is fixed, so that the low-gloss region is formed in part of the surface protective layer, above the low-luster pattern ink layer, and is recognized as a concave portion due to optical illusion. Note, for example, the paragraph bridging pages 19 and 20 of Applicants' specification.

As will be discussed further infra, in Takahashi, the nonpenetrable layer 5 is formed for preventing the penetration of the ionizing radiation curing resin (see column 2, lines 54-60 of Takahashi), and is formed by an ink which is impenetrable by an ionizing radiation curing resin constituting the top coat (see column 5, lines 42-50). It is respectfully submitted that such layers described in Takahashi would have neither disclosed nor would have suggested, and in fact would have taught away from, the ionizing radiation-curable resin composition of the surface protective layer, together with the low-luster pattern ink layer formed by the specified pattern ink having the property of interacting with the ionizing radiation-curable resin composition of the surface protective layer, as in the present claims, and effects achieved thereby.

Similarly, in Takeuchi, et al. the first resin layer 2A, the second resin layer 2B and the third layer 2C constituting the two-component cured urethane resin layer 2 are layers comprising the two-component cured urethane resin, and the two-component cured urethane resin comprises the specific polyol component and the

isocyanate. Therefore, the third layer 2C in contact with the surface protective layer constitutes the two-component cured urethane resin; and, according to Takeuchi, et al., the third layer 2C has a higher crosslinking density. It is respectfully submitted that the disclosure of Takeuchi, et al., having the third layer 2C with the higher crosslinking density in contact with the surface protective layer, would have neither taught nor would have suggested, and in fact would have taught away from, the presently claimed subject matter, including mixing of components of the surface protective layer and the low-luster pattern ink to provide a mixture not completely compatibilized with each other to provide a suspended state which is fixed, the ink and resin of the surface protective layer causing elution, dispersion and mixing therebetween, this low-luster pattern ink containing a non-crosslinked urethane resin with molecular weight and glass transition temperature as in the present claims, and advantages achieved thereby.

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such decorative material as in the present claims, having features as discussed previously in connection with claims 1 and 2, and, moreover, wherein the low-luster pattern ink forming the low-luster pattern ink layer contains non-crosslinked urethane resin and unsaturated polyester resin as a binder (see claim 3; note also claim 1); and/or wherein the ionizing radiation-curable resin composition contains a (meth)acrylate monomer solely (see claim 4); and/or wherein the pattern ink forming the pattern ink layer has a uneven thickness as in claim 5, particularly forming regions of relative gloss as in claim 6; and/or wherein the surface protective layer contains fine particles, an average particle size of the fine particles being that set forth in claims 7 and 21, in particular, that set forth in claims 8 and 9, with the amount of fine particles

being that set forth in claim 10; and/or wherein the surface protective layer is formed by crosslinking and curing the ionizing radiation-curable resin composition containing ethylene oxide-modified polymerizable compound, and contains particles of baked kaolin, as in claims 11 and 22; and/or wherein a surface of the surface protective layer above the first region has a convex shape (note claims 14 and 25); and/or wherein the substrate is a penetrable substrate (see claim 16); and/or specific woodgrain pattern of the pattern layer as in claim 18.

The invention as presently being considered on the merits in the above-identified application is directed to a decorative material, and to a decorative plate that includes this material, the decorative material being provided with a pattern which has a visual convexo-concave appearance due to a difference in gloss, the material being excellent in durability.

As described on pages 1-6 of Applicants' specification, various surface decorative plates, and decorative sheets thereof, used for furniture or cabinets, having a laminated structure in which a decorative sheet having, for example, a printed woodgrain pattern, is bonded onto a wood material, an inorganic material, a synthetic resin base material, etc., have been proposed. However, previously proposed decorative sheets, for such surface decorative plates, have various problems, including requirements of forming appropriate concave portions for providing portions having a satisfactory feel, requiring complicated processing and having high costs.

Against this background, and as a result of intensive research to provide a decorative material having a proper feel, good appearance and good physical properties, including solvent and abrasion resistance and high laminar strength, the present inventors have found that the desired material can be formed by providing a

specific pattern ink layer, of specified material, selectively on a substrate, with a surface protective layer being provided in direct contact with the pattern ink layer and covering a whole surface of a substrate including both a region where the pattern ink layer is formed and a region where the pattern ink layer is not formed, the pattern ink of the pattern ink layer, which includes a non-crosslinked urethane resin, having a specified molecular weight and glass transition temperature, and having a specific characteristic with respect to the ionizing radiation-curable resin composition used for forming the surface protective layer. The pattern ink interacts with the ionizing radiation-curable resin composition for forming the surface protective layer to cause elution, dispersion and mixing therebetween. Through the relationship between the two layers in direct contact with each other, and as described in the paragraph bridging pages 19 and 20 of Applicants' specification, the pattern ink layer and uncured ionizing radiation-curable resin of the surface protective layer are not completely compatibilized with each other, but are kept in a suspended state, so that the suspended portions gather light to form the low-gloss region. According to the present invention, when the surface protective layer is crosslinked and cured while maintaining the suspended state, the suspended state can be fixed, so that the low-gloss region 4 (see Figs. 1-3 of Applicants' disclosure) is formed in a part of the surface protective layer, over the low-luster pattern ink layer and in the vicinity thereof, and recognized as a concave portion due to optical illusion.

As set forth in the claims of the above-identified application, the pattern ink contains a non-crosslinked urethane resin, having a specific molecular weight and glass transition temperature, and, together with the resin composition of the surface protective layer, effectively provides the elution, dispersion and mixing as discussed previously, achieving effects of the present invention.

To be emphasized is that the low-luster pattern ink layer acts in combination with the surface protective layer in the present invention, in view of direct contact therebetween, and in view of specified interaction therebetween due to materials of these layers, to provide the low-gloss region achieving the appearance of the presently claimed decorative structure.

Note, in particular, pages 19-24 of Applicants' specification. As described therein, the pattern ink layer 3 (see Fig. 1) serves for generating the difference in gloss of the pattern; and it is suggested that resin components of the ink contained in the pattern ink layer, and uncured ionizing radiation-curable resin, are not completely compatibilized with each other but are kept in a suspended state and located in a portion just above the pattern ink layer, so that the suspended portion scatters light to form the low-gloss region. When the surface protective layer is crosslinked and cured while maintaining the suspended state, such a suspended state is fixed, so that the low-gloss region 4 (see Fig. 1) is partially formed in the surface protective layer, and recognized as a concave portion due to optical illusion.

Moreover, by varying coating amount of the pattern ink layer, the pattern ink layer can have an uneven ink thickness, allowing the extent of the portion visually recognized as a concave portion to be stepwise or continuously changed; and, as a result, the decorative material can exhibit a gradation pattern with a difference in gloss which is changed stepwise, or a continuous pattern with the difference in gloss being changed continuously. See page 24, lines 8-19, of Applicants' specification. Note especially claims 5 and 20, and claims dependent thereon.

According to the present invention, it is important that the pattern ink of the pattern ink layer and the material of the surface protective layer are in direct contact

with each other and interact with each other as set forth in the present claims. Note, for example, page 29, lines 13-19, of Applicants' specification.

Takahashi discloses a synchronously embossed decorative sheet including, inter alia, a pattern layer provided on the substrate, a nonpenetrable layer provided on the pattern layer, in tune with the pattern in the pattern layer, the nonpenetrable layer comprising a coating composition being nonpenetrable by an ionizing radiation curing resin; and a top coat layer provided so as to cover the layers on the substrate and to conform to the shape of concaves and convexes in the pattern layer. See column 2, lines 17-33. Note also column 2, lines 54-66. See, further, column 3, lines 1-3; and column 4, line 67, to column 5, line 3.

In Takahashi, the nonpenetrable layer 5 is formed for preventing penetration of the ionizing radiation curing resin, and is formed by an ink nonpenetrable by an ionizing radiation curing resin constituting the top coat. It is respectfully submitted that disclosure of the nonpenetrable layer 5 and of the top coat in Takahashi would have neither disclosed nor would have suggested, and in fact would have taught away from, the presently claimed decorative material, including, inter alia, wherein the resin components of the pattern ink interact (mix) with but are not completely compatibilized with the ionizing radiation-curable resin composition to be kept in a suspended state which is fixed upon curing the surface protective layer, whereby the interaction provides elution, dispersion and mixing therebetween, quite different from the ink forming the nonpenetrable layer 5 and top coat of Takahashi.

Moreover, Takahashi would not have taught or suggested a pattern ink layer, as in the present claims, that includes a non-crosslinked urethane resin of a number average molecular weight of 10,000 to 50,000 and a glass transition temperature of -70° to -40°C.

It is emphasized that in Takahashi, a decorative sheet is obtained by providing a nonpenetrable layer on only a pattern layer, by the use of a nonpenetrable ink, with a top coat 6 provided above the entire surface of the sheet. In this case, the top coat 6 remains on the nonpenetrable layer, of course, without penetration thereof (i.e., with no interaction therewith); and in a region where no nonpenetrable layer is provided, the top coat will penetrate into a penetrable layer to cause a physically different level in height to appear, and to form a concavo-convex pattern. That is, the combination of the penetrable and nonpenetrable layers, together with the top coat, causes the physical concavo-convex pattern to appear. Note, for example, column 2, lines 54-67 of Takahashi.

In contrast, according to the present invention, the decorative material sheet is obtained by applying the ionizing radiation-curable resin composition directly on a low-luster pattern ink layer (which ink layer includes a non-crosslinked urethane resin), resin of the pattern ink layer not being completely compatible with resin of the ionizing radiation-curable resin composition providing a surface protective layer, and due to, e.g., the mixing with lack of complete compatibility of the low-luster pattern ink layer with the ionizing radiation-curable resin composition, a low-gloss region is formed having a mat feeling to obtain a decorative sheet excellent in design property, which has the illusion of a visual concavo-convex pattern.

As can be seen in the foregoing, Takahashi, with different structure including the non-penetrable layer 5 in direct contact with the top coat 6, operates by a different mechanism from the present invention; and it is respectfully submitted that Takahashi would have neither disclosed nor would have suggested the presently claimed structure, including the pattern ink of the pattern ink layer, of materials

relative to that of the surface protective layer as recited in the present claims, and low-gloss region formed and advantages due thereto.

It is respectfully submitted that the teachings of the additional references as applied by the Examiner in combination with the teachings of Takahashi as the primary reference, would not have rectified the deficiencies of Takahashi, such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Morishima, et al. discloses an aqueous emulsion comprising a self-emulsifiable copolymer in which at least one ethylenically unsaturated monomer and at least one urethane prepolymer having at least one mercapto group and at least one hydrophilic, polar group are bonded by radical. See column 3, lines 13-19, for example. See also column 4, lines 32-40; and column 7, lines 9-62. Note also column 12, lines 49-60, with respect to the molecular weight of the self-emulsifiable copolymer. The Examiner has referred to column 9, lines 25-30, and column 13, lines 1-15, with respect to the molecular weight of the urethane as in the present claims.

Initially, it is emphasized that Morishima, et al. is directed to a self-emulsifiable copolymer. It is respectfully submitted that one of ordinary skill in the art in connection with Takahashi, or facing problems addressed in the present invention, would not have looked to the teachings of Morishima, et al. In other words, Takahashi and Morishima, et al. are directed to non-analogous arts.

Moreover, there would have been no proper reason to combine the teachings of these references other than through hindsight use of Applicants' disclosure, which hindsight use is improper under the requirements of 35 USC 103.

In any event, even if the teachings of Takahashi and Morishima, et al. were properly combinable, such combined teachings would have neither disclosed nor would have suggested the presently claimed invention, including the interaction of the pattern ink layer and surface protective layer, or use of the non-crosslinked urethane resin having, inter alia, the glass transition temperature as in the present claims, and advantages achieved thereby.

Tsukada, et al. discloses a decorative sheet including a sheet having a transparent plastic first substrate sheet and a pattern-printed layer partially or wholly embedded in one or both of the surfaces of the first substrate sheet, a laminate sheet being formed by laminating a transparent plastic second substrate sheet on one surface of the above-mentioned sheet, and a sheet formed by laminating a plastic third substrate sheet having a concealing effect on one surface of the above-mentioned sheet or laminate sheet. See column 1, lines 31-42. Note also column 2, lines 3-8. See, further, column 6, lines 53-55.

Even assuming, arguendo, that the teachings of Tsukada, et al. were properly combinable with the teachings of Takahashi and Morishima, et al., such combined teachings would have neither disclosed nor would have suggested the present invention, including, inter alia, the layers in direct contact, or the interaction of the pattern ink of the pattern ink layer, with respect to the ionizing radiation-curable resin composition, achieving the effect as in the present claims, or other features of the present invention as discussed in the foregoing. Again, it is emphasized that by having the surface protective layer in direct contact with the pattern ink layer, and the layers made of materials as in the present claims, the low-gloss regions is formed and achieves the beneficial visual effect of the present claims. It is respectfully submitted that the combined teachings of references as applied by the Examiner do

not disclose, nor would have suggested, such materials with the recited interaction of the pattern ink and the direct contact, the effect achieved in combination, and advantages thereof; or the specific structure of the low-gloss region, and advantages thereof; or other features of the present invention set forth in the dependent claims, and advantages thereof.

Ogawa, et al. discloses an amorphous silica filler, which exhibits excellent handling properties and processability, and which, when added to a resin film, exhibits excellent dispersing properties, transparency and anti-blocking property, the amorphous silica filler being described, for example, in column 2, lines 33-45. As for properties of the amorphous silica filler, note column 3, lines 54-65, of this patent. See, paragraph bridging columns 3 and 4 of this patent, as well as column 7, lines 17-34.

Even assuming, arguendo, that the teachings of Ogawa, et al. were properly combinable with the teachings of the other references as applied by the Examiner, such combined teachings would have neither disclosed nor would have suggested the presently claimed decorative material, including, inter alia, wherein the surface protective layer and the pattern ink layer are in direct contact with each other, with, e.g., the pattern ink of the pattern ink layer interacting with the resin composition of the surface protective layer, providing structure of the low-gloss region, providing various advantages achieved by the present invention; and/or other features of the present invention discussed previously, and advantages thereof.

It is respectfully submitted that the additional teachings of Klun, et al., as applied by the Examiner, even in combination with teachings of the other references as applied by the Examiner, would have neither disclosed nor would have suggested the presently claimed subject matter.

Klun, et al. discloses protective, organic coatings for wood and other substrates, the coatings being formed from radiation-curable thermoplastic coating compositions. The disclosed compositions include normally solid, organic solvent-soluble, thermoplastic, polyethylenically-unsaturated, cellulosic polyurethane polymers as described most generally in column 3, lines 27-61 of this patent. See also the paragraph bridging columns 3 and 4 of this patent.

Even assuming, arguendo, that the teachings of Klun, et al. were properly combinable with the teachings of the other references as applied by the Examiner, it is respectfully submitted that such combined teachings would have neither disclosed nor would have suggested, and in fact would have taught away from, the presently claimed invention, including the surface protective layer and pattern ink layer being in direct contact with each other, and materials of the pattern ink with respect to that of the surface protective layer, or wherein the pattern ink includes a non-crosslinked urethane resin with molecular weight and glass transition temperature as in the present claims, and low-gloss region, and advantages thereof.

MacQueen discloses a covering having a surface texture, and methods of making the same, in particular, a textured coating including a surface coating characterized by a coating thickness and a plurality of expanded micro-capsules having a diameter, wherein the coating thickness is less than the diameter of the micro-capsules. Note column 2, lines 31-36; see also column 1, lines 33-35; and column 2, lines 10-15 and 37-44.

Even assuming, arguendo, that the teachings of MacQueen were properly combinable with the teachings of the other references as applied by the Examiner, such combined teachings would have neither disclosed nor would have suggested the presently claimed invention, including the surface protective layer in direct

contact with the low-luster pattern ink layer; and/or material of the low-luster pattern ink forming the low-luster pattern ink layer and interaction thereof with uncured resin composition of the surface protective layer, and/or the low-gloss region, and effects of the present invention.

It is respectfully submitted that the combination of teachings of references as applied by the Examiner on pages 13-27 of the Office Action mailed August 4, 2010, including the teachings of U.S. Patent No. 6,558,799 to Takeuchi, et al. as primary reference, would have neither disclosed nor would have suggested the presently claimed invention.

Takeuchi, et al. discloses a decorative material for use, for example, in surface material including decorative sheets, the decorative material including a substrate having at least on its surface an active hydrogen-containing polar functional group; and, provided on the substrate, a two-component cured urethane resin layer and a surface resin layer of a crosslinked coating formed from an ionizing radiation curable acrylate resin, the two-component cured urethane resin layer having a structure of at least three layers of a first resin layer, a second resin layer, and a third resin layer provided in that order from the substrate side, the crosslinking density of the second resin layer being lower than that of the first resin layer and that of the third resin layer. See column 2, lines 13-25. Note also column 2, lines 26-31. This patent goes on to disclose that at least one of the at least three layers constituting the two-component cured urethane resin layer may function as a decorative layer. See column 3, lines 48-53. Note also column 4, lines 31-36.

In the second paragraph on page 14 of the Office Action mailed August 4, 2010, the Examiner contends that Takeuchi, et al. does not teach a concave portion and ink layer in that order laminated "over the order per the instant claims"; the

Examiner is respectfully requested to clarify this paragraph. In any event, it is respectfully submitted that Takeuchi, et al. discloses, as an essential feature thereof, that the urethane resin is a two-component curable urethane resin, which would have neither disclosed nor would have suggested, and in fact would have taught away from, wherein the pattern ink forming the low-luster pattern ink layer contains a non-crosslinked urethane resin as in the present claims, more particularly wherein such pattern ink contains the non-crosslinked urethane resin and an unsaturated polyester resin as a binder, especially wherein the non-crosslinked urethane resin has a number average molecular weight and glass transition temperature as in all of the present claims.

Furthermore, attention is respectfully directed to column 2, line 66, through column 3, line 14 of Takeuchi, et al., describing that the use of the specific polyol component in the formation of the two-component cured urethane resin layer can easily improve modulus of elasticity of the two-component cured urethane resin layer, and, in addition, can further improve the adhesion between the two-component cured urethane resin and the surface resin layer. That is, it is respectfully submitted that Takeuchi, et al. discloses the two-component curable resin composition which is cured, e.g., to improve adhesion to the substrate. It is respectfully submitted that the present invention, utilizing the non-crosslinked urethane resin which, together with the resin composition of the surface protective layer provides the low-gloss region as in the present claims, is entirely different from the curable urethane resin used in Takeuchi, et al., which is cured in the formed product; and it is respectfully submitted that this disclosure of Takeuchi, et al. would have taught away from the presently claimed subject matter, including use of the non-crosslinked urethane in the pattern ink layer, particularly having a number average molecular weight and glass transition

temperature as in the present claims, or the interaction of the pattern ink with the uncured radiation-curable resin of the surface protective layer forming the low-gloss region, achieving advantages of the present invention.

It is emphasized that in Takeuchi, et al., the layer 2C, in contact with the surface resin layer 3, is described as having a relatively high crosslinking density, and is not disclosed as a patterned layer partially (selectively) provided on the substrate. It is respectfully submitted that the teachings of Takeuchi, et al., even in combination with the teachings of Takahashi and Morishima, et al., would have neither taught nor would have suggested the pattern ink layer formed on part of the substrate, in direct contact with the surface protective layer, the pattern ink of the pattern ink layer interacting with the uncured resin of the resin composition of the surface protective layer and the interacted materials being fixed in a suspended state upon curing the surface protective layer, as in the present claims, and the pattern ink including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in all of the present claims, and advantages thereof.

Moreover, it is again emphasized that according to Takeuchi, et al., the third layer 2C in contact with the surface protective layer comprises a two-component cured urethane resin. And according to Takeuchi, et al., the third layer 2C has a higher crosslinking density. In contrast, according to the present invention the pattern ink forming the low-luster pattern ink layer contains, e.g., non-crosslinked urethane resin having a specified molecular weight and glass transition temperature, noting particularly claims 1 and 2. The cured two-component urethane resin in Takeuchi, et al. has a three-dimensionally crosslinked network molecular structure, different from the non-crosslinked urethane resin of various aspects of the present

invention, having a linear molecular structure. Moreover, it is again emphasized that according to the present invention the pattern ink has the property of interacting with the ionizing radiation-curable resin composition. As can be seen from the foregoing, the structure according to the present invention is different from, and would not have been obvious over, the teachings of Takeuchi, et al., even in light of the teachings of secondary references as discussed infra.

That is, it is respectfully submitted that the additional teachings of secondary references as applied together with Takeuchi, et al., on pages 13-27 of the Office Action mailed August 4, 2010, would not have rectified the deficiencies of Takeuchi, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Takahashi and Morishima, et al. have been previously discussed.

For the same reasons as given previously, it is respectfully submitted that one of ordinary skill in the art concerned with in Takeuchi, et al. and in Takahashi would not have looked to the teachings of Morishima, et al; that is, Morishima, et al. is directed to a non-analogous art with respect to that in Takeuchi, et al. and Takahashi, and that of the present invention.

Moreover, emphasizing that Takeuchi, et al. discloses use of highly cross-linked urethane, the teachings of the applied references, including Takeuchi, et al. as primary reference, would have neither taught nor would have suggested the present invention, including the pattern ink layer comprising the non-crosslinked urethane which has the specified properties including glass transition temperature, and including the pattern ink layer being formed on a part of the substrate, in direct contact with the surface protective layer, with the pattern ink layer having the interacting with the surface protective layer as in the present claims, and other

features of the present invention as discussed in the foregoing and advantages thereof.

Even combining the teachings of Takahashi and Morishima, et al., with the teachings of Takeuchi, et al., and even further in view of the teachings of Tsukada, et al., such combined teachings would have neither disclosed nor would have suggested the presently claimed invention, including the pattern ink layer formed on a part of the substrate, in direct contact with the surface protective layer, with the pattern ink interacting with the ionizing radiation-curable resin composition for forming the surface protective layer to provide the suspended state, fixed upon crosslinking and curing the surface protective layer, whereby the recited elution, dispersion and mixing is provided, the pattern ink including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in the present claims, and/or other features of the present invention as in the dependent claims, including the more specific definition of the low-gloss region, and advantages of the present invention.

The teachings of McQueen, Klun, et al. and Ogawa, et al. have previously been discussed. Even assuming, arguendo, that the teachings of these applied references were properly combinable with the teachings of the other applied references including Takeuchi, et al., such combined teachings would have neither taught nor would have suggested features of the present invention as discussed in the foregoing, including (but not limited to) the pattern ink layer formed on a part of the substrate, in direct contact with the surface protective layer, with resin components of the pattern ink being mixed with uncured ionizing radiation-curable resin composition for forming the surface protective layer and not completely compatibilized therewith so as to be in a suspended state, fixed upon curing the

surface protective layer to cause the recited elution, dispersion and mixing, the pattern ink including a non-crosslinked urethane resin having a number average molecular weight and glass transition temperature as in the present claims; and/or other features of the present invention as in the dependent claims, including the more specific definition of the low-gloss region, and advantages of the present invention.

Applicants respectfully traverse the contention by the Examiner that Takahashi has the same materials and same structure as in the present invention. Contrary thereto, it is respectfully submitted that the same materials and same structure are not in Takahashi. It is again emphasized that in Takahashi a non-penetrable layer 5 is described; according to the present invention the pattern ink has the property of, inter alia, mixing with the radiation-curable resin composition of the surface protective layer. Clearly, the structures, as well as materials forming such structures, are not the same, the present invention providing a mixed low-gloss region while Takahashi discloses no penetration of the top coat into the non-penetrable layer.

Applicants respectfully traverse any contention by the Examiner that Takahashi explicitly teaches all of the layers, and their gloss and concave/convex appearances. As seen from the foregoing, Takahashi provides concaves and convexes by a different mechanism than that of the present invention, Takahashi physically providing concaves and convexes, while the present invention utilizes a different structure which, due to interaction between the surface protective layer and pattern ink layer, provides an optical illusion of concavo/convex appearance. It is respectfully submitted that the Examiner errs in contending that Takahashi teaches all of the layers and their gloss and convex appearances as in the present invention.

On page 2 of the Office Action mailed August 4, 2010, the Examiner sets forth that layer 5 in Takahashi is a layer not penetrable by the top coat 6. In view thereof, it is respectfully submitted that the Examiner has not provided a basis for concluding interaction in Takahashi between the non-penetrable layer 5 and top coat 6, as recited in the present claims. Again emphasizing that Takahashi discloses that the top coat 6 is not penetrable into the layer 5, clearly the disclosure of this patent would have taught away from the pattern ink layer as in the present claims, with resin components of the pattern ink mixing but not completely compatibilized with the ionizing radiation-curable resin composition so as to be kept in a suspended state, fixed upon crosslinking and curing the surface protective layer, to provide partial elution, dispersion and mixing, with the low-luster pattern ink containing at least a non-crosslinked urethane resin as a binder, the non-crosslinked urethane resin having a number average molecular weight in a range of 10,000-50,000 and a glass transition temperature in a range of -70° to -40°C, and advantages achieved thereby as discussed in the foregoing.

The contention by the Examiner that “the exact same results and properties are inherently expected” in Takahashi, “because the exact same material and exact same structure . . . is employed”, is respectfully traversed. Contrary to the contention by the Examiner, it is respectfully submitted that the exact same material and exact same structure are not employed in Takahashi as in the present invention. Clearly, in view of the express teachings of Takahashi of layer 5 being a non-penetrable layer with respect to the top coat, the express teachings of Takahashi establish that the exact same results and properties are not provided in Takahashi, and the exact same materials and structure are not set forth therein.

The contention by the Examiner in the third paragraph on page 30 of the Office Action mailed August 4, 2010, that layer 5 of Takahashi is not penetrable by topcoat 6, the Examiner submitting that layer 5 is the low-luster ink pattern, is noted. Applicants agree with this interpretation by the Examiner of Takahashi. However, with such interpretation, where layer 5 of Takahashi is not penetrable by topcoat 6, there would be no mixing of resin components of the low-luster pattern ink in the low-luster pattern ink layer and uncured radiation-curable resin of the ionizing radiation-curable resin composition, and there would be no mixing wherein the components of the mixture are not completely compatibilized with each other and are kept in a suspended state, which mixture is fixed upon crosslinking and curing the surface protective layer. Acknowledging that layer 5 of Takahashi is not penetrable by topcoat 6, the Examiner has provided no basis as to how resin components of the low-luster pattern ink of layer 5 and topcoat 6 in Takahashi can be mixed but not completely compatibilized and are kept in a suspended state, as in the present claims. Accepting the Examiner's characterization of layers 5 and 6 of Takahashi, in particular wherein layer 5 thereof is not penetrable by topcoat 6, it is respectfully submitted that Takahashi teaches away from the presently claimed invention including the mixture of components in the low-gloss region as in the present claims, not completely compatibilized with each other and kept in a suspended state, which is fixed upon crosslinking and curing the surface protective layer, providing the structure of the low-gloss region as in the present claims.

In view of the foregoing comments and amendments, and in view of the concurrently filed RCE Transmittal, entry of the present amendments, and reconsideration and allowance of all claims presently in the above-identified application, are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 396.46088X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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